MASTER

XXX

Agricultural Memorandum No. XXX

Humidity Readings at 9 a.m.

Introduction

Climatological stations only report humidity once per day (at 9 a.m.). For some reasons, such as the calculation of potential transpiration, the average absolute humidity over the 24 hours is required.

Based on the evidence of long-term means it is often assumed that the 0900 reading is a fair approximation to the daily mean. The present short investigation was designed to test this assumption.

Monthly Means

The April to September 0900 means of absolute humidity for Eskdalemuir (1949-53), Kew (1949-1953) and South Farnborough (1952-3) were compared with the 24 hour means over the same period. The mean difference was slightly under 0.3 mb., the distribution of differences being as follows:-

Differences 0900 mean minus 24-hour mean

+0.8	+0.6	+0.4	+0.2	0.0	-0.1	-0.3	-0.4	
+0.7	+0.5	+0.3	+0.1		-0.2	-0.4	-0.5	mb.
4	11	20	21	7	4	2	1	occasions

The root mean square is 0.35 mb.

Daily Values

The daily values of the 0900 reading of absolute humidity at Boscombe Down from April to September 1959 were compared with the 24 hour means. The mean difference was 0.9 mb., the distribution of differences being:-

Differences 0900 reading minus 24-hour mean

Greater than +3.0	+3.0 to +2.6	+2.5 to +2.1	+2.0 to +1.6	+1.5 to +1.1	+1.0 to +0.6	+0.5 to +0.1	0.0	mb
3	1	14	12	17	31	45	7	occasions

-0.1 to -0.5	-0.6 to -1.0	-1.1 to -1.5	-1.6 to -2.0	-2.1 to -2.5	-2.6 to -3.0	Greater than -3.0	mb.
27	14	5	6	0	0	1	occasions

The root mean square is 1.18 mb.

Conclusion

Anyone forced to use 0900 values in any calculation should be aware of the possible errors involved.

Harrow,
May, 1960

T. Applegate
L. P. Smith.

G.1469/DEW/5/60/50